PHYSICAL TRAINING AS A COMPULSORY SUBJECT[1]

DR. DUDLEY A. SARGENT
Harvard University

During the past few years the question has frequently arisen, in this country and in Europe as to whether the enormous amount of money devoted to education was being wisely expended. Many cities, in their desire for economy, have attempted to cut off what they termed the "frills and fads" in education, and in so doing have invariably struck the first blow at drawing, music, or gymnastics. In some cities, especially in New York, Chicago, and the more thickly populated communities, the attempts to do away with these fundamental branches of education have met with such decided opposition from the parents of the children that henceforth whatever else may be stricken from the curriculum these branches are likely to remain.

The discussions growing out of this agitation over school expenditures lead to an investigation in New York City of the condition of the school children. The light of investigation revealed homes and schoolrooms that were dark, dingy, and poorly ventilated; children with eyesight so defective that they could not see the blackboard, with hearing so defective that they could not hear more than half that was said to them; children with adenoid growths that interfered with their breathing and rendered them mentally dull; children languid, listless, and anaemic, for want of sufficient nourishment. As soon as these conditions were brought to the attention of the school authorities and the proper remedies were provided, there was an immediate improvement in the physical and mental tone of the pupils most afflicted.

The facts brought out in New York and Chicago have led to the adoption, in Boston and other cities, of an extended system of school hygiene, whereby the physical condition of the pupils may receive a more careful consideration. The establishment of health clubs, health education leagues, and the growing popularity of preventive medicine, all attest to the value which the people are begin-

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ning to place upon health as an asset in their social, domestic, business, and professional lives.

But should the health education of our children and youth stop at the prevention of disease and the correction of physical and mental defects? Is it not time that more constructive work should be done in the way of increasing our mental and physical vigor, quickening the senses, sharpening the intellect and augmenting as far as possible vitality and the natural powers of resistance? In other words in the terms of the subject assigned to me "Does not physical training in view of its effect on the intellect and will as well as on the body, deserve to become a compulsory subject in school and college and to receive corresponding credit in the system of marking?"

Physical training as at present conducted in our schools and colleges is largely a hygienic measure. In many institutions its chief function is to prepare students for athletic contests. In only a few schools is it regarded as an essential part of the educational system, and as a preparation for life. The reason for this indifference and, in some cases, decided opposition, to physical training on the part of the school authorities may be traced to several sources: First, the peculiar veiws of the old time philosophers and metaphysicians regarding the relation of mind and body; second, the influence of the church and monastic schools following the adoption of the Christian religion; third, the feeling, engendered by the beliefs of the early philosophers and Christians, that the body was inferior to the mind, and that those who worked with the body, or for the body, were necessarily of a lower social order. Among the Greeks mind and body were regarded as fellow-workers and were trained together, for a common purpose at the academy and lyceum. Later, we read the body gradually came to be neglected and despised. A powerful influence was given to this movement by the diffusion of Christianity, and especially by the gorgeous visions of a glorious immortality which were opened to the astonished minds of men awaking from a long pagan night. Body and mind were thenceforth held, by philosopher and Christian to have separate and antagonistic interests. To the philosopher, the body was a clog, and impediment to the acquisition of knowledge—a something perpetually interfering, by its pain, its sorrows, and its imperfections, with the clear views of truth which he supposed the unencumbered soul would obtain. To the Christian the body was sin incar-

nate, the source of all evil and temptation, the barrier between the soul and heaven. There is something even amusing in the excess of contempt in which the body was held, and the abuse heaped upon it. A prison house, a cage, a weary load of mortality—these are in comparison complimentary terms. In fine, the body was considered the source of all evil, and as such worthy only of contempt. The Platonist, as St. Augustine says, "holds that these our mortal members do produce the effects of fear, desire, joy, and sorrow, in our bodies; from which four perturbations the whole inundations of man's enormities have their source and spring." In the light of our present-day knowledge these emanations of the early philosophers and Christians bear eloquent testimony to the facts that we shall consider farther on—namely that the condition of the body does most assuredly influence the condition of the mind.

During the Middle Ages the church considered education to be its special function, and the elementary schools existed in connection with the monasteries, the cathedrals or collegiate churches, the hospitals, and the guilds. At this time little or no attention was given to the body. The schoolrooms, methods, and discipline were in harmony with the ascetic spirit of the age. However, in the sixteenth and seventeenth centuries interest in the body was revived, and gymnastics were introduced in many of the schools. The prime movers in this revival of interest in physical education were Rabelais, Montaigne, Comenius, Locke, Rousseau, Bacon, and other educational reformers. Later this special movement was more highly developed by Basedow, Gutsmuth, Jahn, Salzmann, and Spies in Europe, and by Follen, Beck, and Lieber in this country. The influence of the early philosophers, the early Christians, and the church fathers molded and controlled the curriculum of our schools and colleges up to within the past fifty years. The educational reformers did much to liberalize the course of studies and popularize physical exercise, but the fact remains that even at the present day the vast majority of our institutions of learning still hold, in practice, if not in theory, that body and mind have separate and antagonistic interests, and therefore cannot be considered in the same curriculum. This position of the schools is rendered somewhat anomalous at the present time from the fact that the philosophers as interpreted by the modern psychologists now repudiate all antagonisms between body and mind and the church organizations and Christian associations now regard physical training as one of their strongest allies in carrying on their Christian work.

Let us consider briefly some of the facts in regard to the relation of body to mind which it has been the province of the physiological psychologist to unfold. All psychologists of the present day are practically united in their views of the interdependence of mind and body. The only ground for differences of opinion is in the causal relations. Those in favor of the theory of interactionism claim that the brain is simply the instrument of the mind, that causal relations run both ways, from the body to the mind as sensations, and from the mind to the body as volitions or motor impulses. The theory of automatism, first advocated by Huxley, maintains that the causal relation runs in only one way, namely from the body to the mind. The theory of parallelism first brought into prominence by W. K. Clifford denies all causal influence and asserts, conditionally, that mind and body are opposite sides of the same thing. Concerning the merit of these three theories I must leave you to draw your own conclusions. All are based upon facts with which mankind has been more or less familiar for generations. It is upon these facts which show a most intimate connection—a psychophysical relation—between body and mind that I shall base my argument in favor of making bodily training an essential part of the school curriculum.

Some of the more common effects of the body upon the mind may be briefly mentioned. Bathing the face, head, and neck in cold water stimulates mental activity. So will a cup of tea, coffee, or cocoa, a light, warm breakfast, or a short brisk walk in the fresh air. The sights we see, the sounds we hear, the odors we smell will influence our mentality and color our thoughts and feelings throughout the day; so will the condition of the weather, the temperature, humidity, density, and electrical state of the atmosphere. Excessive bodily fatigue may cause unconsciousness. A person who has lost consciousness by a blow on the head, may awake mentally deranged, or with memory impaired, the faculty of speech partially or wholly destroyed, or he may return to consciousness intellectually brighter than before. The use of drinks, drugs, and medicines depends upon their specific effects. For instance alcohol in its various forms gives one a feeling of exhilaration, hasheesh exalts the sensations, opium enriches the fancy and imagination, chloral, sulphonal, trional, and the bromides act as narcotics, putting one quietly to sleep, cocaine takes away the feeling of local pain, while ether, chloroform, or nitrous oxide temporarily abolish all consciousness of pain. Nearly all the activities of the day, and all the influences that bring

about sleep, causing us to spend one-third of our time in a state of unconsciousness, are largely of the body, or physical in their origin. The physical changes in both body and mind are brought about through the agency of the circulation, respiration, digestion, etc. A well-organized, efficient brain is dependent upon a vigorous heart, capacious lungs, good liver and excretory organs, and all of these parts may be dependent for the proper performance of their functions upon a good stomach and perfect assimilation of food. Thus education is dependent upon and may be regarded as a form of nutrition. The condition of the bodily organs affects the mental state specifically. With a strong, vigorous action of the heart there is a feeling of courage, and general exaltation; with a weak heart fear predominates and an enfeebled circulation depresses mental activity. Ample lungs are usually accompanied by an optimistic spirit and a happy, sanguine disposition. A disordered liver occasions low spirits and a blue, bilious state of mind. A weak stomach and chronic dyspepsia may occasion irritability, peevishness, and sullen fits of temper. Imperfect intestinal digestion or obstinate constipation will frequently occasion a feeling of impending danger and gloomy forboding, sometimes ending in melancholia. A slight irritability or congestion of the generative organs may occasion all sorts of mental symptoms from the silly freaks of a hysterical girl to the highest flights of a poetic genius. "No philosophy can cure us of the blues" or relieve us of the mental disturbances occasioned by the disordered functions of the bodily organs. A restoration to sound physical condition is the only remedy.

Our organic functions are molding our bodies and determining our constitutions and our temperaments and working on our wills and characters. Through the influence of the blood, muscles, and nerves the complex mechanism which we term the body is unified. This absolute unity of the body, this condition in which the part everywhere works in the whole and the whole in every part, is becoming more and more apparent to the educational psychologist.

There is in regard to the bodily organism [says Mandsley] a further consideration which is not always adequately realized—namely that it is a self-adjusting and self-registering structure; the modifications which it undergoes through exercise do not pass away without after-effects, but are embodied in the structure and made part of its nature, so that they enter into the life and function ever afterward. Its life principle is indeed a principle of continuity: in the living present the incorporate past is active. "Our

deeds follow us from afar, and what we have been makes us what we are." The organic registration affords an instructive instance of the operation of the law of the conservation of energy in the fashioning of the will. For we perceive that in an act of will, which always renders easier a following similar act, not all of the energy is expended in the outward effects that it accomplishes, but some of it goes to lay the foundation of a future will. So it is that will remembers and learns to will, exercise building up faculty, and conduct character; and that the will becomes according to its training, either the calm agent of strength, or the shifty accomplice of weakness.

Training the will! What is more important in education? Yet just how this result is brought about through physical training has not been understood until a comparatively recent period. A well-organized brain consists of millions of cells commonly called sensory, and motor cells, and the associated brain fibers which connect them. An efficient working brain calls for the development of these three parts. A failure to develop any one part means that the function of the brain as a whole will be imperfect. The only way known to develop an organ or part of either body or brain is to give it its appropriate exercise. It is the special function of the sensory nerves and brain cells to take in sensations from the outer world through the eyes, ears, nose, muscles, skin, tongue, etc., and to give expression to these sensations in terms of action through the motor cells. "No impression or idea of eye, ear, or skin comes to us," says Professor James, "without occasioning a movement, even though the movement be no more than the accommodation of the sense organ." "Sensation never exists as an end in itself," says Dr. Halleck. "We live and secure things through action only. If a sensation does not lead to action either immediate or remote, the sensation is worthless. That education which divorces ideas from action is a curse." According to the biologist the brain has been evolved for the purpose of guiding and controlling the movements of the body through the actions of the muscles. How is this guiding and controllng power developed? The earliest movements of the child are reflex, instinctive, and impulsive. It does not will to move its arms and legs—it simply moves them in response to the stimuli playing upon its senses from without. Later, if you place your finger in the child's hand the hand will grasp it; put a glass stopper in its mouth and the child will suck it; exert a little upward pressure on its feet and it will extend its legs. The eyes will follow a light, the head turn in the direction of a sound, and every sensa-

tion will be followed by a motor impulse. When the infant becomes a child toss a rubber ball to it to catch. The ball will go through its hand and strike its body or face. The child cannot will to catch the ball because it cannot act purposely or intelligently. It has no idea of what it must do to catch the ball. Here again, to quote Professor James

> Before the idea can be generated, the movement must have occurred in a blind, unexpected way and left its idea behind. Reflex, instinctive or random execution of a movement must, in other words, precede its voluntary execution.

Put in still another way we cannot do an act voluntarily unless we know what we are going to do, and we cannot know exactly what we are going to do until we have taught ourselves to do it. In more senses than one we learn by doing. The simplest movement brings about a change in the organic structure of the brain, and this change leads to more complex movements and further improvement of brain structure. Most skilled movements give more exercise to the central nervous systems than to the muscles. Movements calling for a high degree of skill, correlation of the different senses, sense discrimination, fine co-ordinations, and a rapid and responsible exercise of judgment all tend through action of the associative fibers to a high degree of brain development. For this reason students often find that fencing bouts exhaust them mentally and unfit them for the time being for further mental efforts in study. It has been found, in the attempts that have been made to educate idiots and the feeble minded, that muscular movements, and simple exercises, and the handling of objects and playthings furnished the best means of getting ingress to their minds. With less marked cases of mental deficiency the interest awakened by gymnastics, and by plays, games, and athletic sports calls forth decided mental efforts and results in marked physical, mental, and moral improvement. The experiment tried at the Elmira Reformatory in 1886 further illustrates the power of physical processes in awakening a higher degree of mentality. A class of twelve dullards was selected from the inmates of that institution and put through a systematic course of physical training for five months. Nearly all showed decided improvement in physical development, moral character, and mental efficiency. As a matter of fact, criminals, dullards, the feeble minded, and the insane as a class are considerably

below the average normal individual in physique, as shown by height and weight, while the members of any organization known for distinguished mental ability, like those of the Royal Society of England, will be found to be above the average normal height and weight. By ascertaining the physical condition of large numbers of people, the natural correlation between body and mind may readily be shown. In the year 1893 Dr. Wm. T. Porter examined some thirty thousand children who were in the public schools of St. Louis. He found that, among pupils of the same age, the average height and weight of those who were in the higher grades was greater than that of those who were in the lower grades. In other words, he found that those pupils who were mentally the most precocious were also physically the most precocious. This announcement called forth considerable criticism at the time, and many teachers, recalling a number of exceptionally bright pupils who were small in stature for their age, doubted the truth of the statement. It may be of interest therefore to note that Dr. Porter's conclusions have since been confirmed by observations made by Dr. Hasting in Omaha, Neb., by Dr. Byer in Cambridge, by Dr. Christopher in Chicago, by Dr. Roberts in London, England, and by Dr. Leharzig in St. Petersburg, Russia. In face of such a body of concurrent statistics from different parts of this country and Europe, no one can doubt for a moment the natural relationship between a vigorous brain and a vigorous body.

But how are the vigorous body and brain attained? No one familiar with the growth and development of the human body, especially with its bones, muscles, brain, nerves, and tissues, can doubt for a moment that useful activity has played the most prominent part in its upbuilding. The natural history of the muscular system alone makes clear to us that there is not a simple movement capable of being performed by man which has not been performed thousands and thousands of times before by his near or remote ancestors. In the history of the bones, muscles, nerves, and other tissues of the body we read the records of his primitive acts and struggles through the ages. Who can doubt the part that walking, running, jumping, swimming, climbing, throwing, pushing, pulling, lugging, tugging, kicking, wrestling, and fighting have played in the development of the human organism? Who can question the developing influence of the great industrial epochs through which man has passed such as the hunting, fishing, pastoral, and agricultural

stages of his existence, and the age of metals, travel, trade, and transportage when man acted as a beast of burden? Consider the probable influence of the house industries from time immemorial and the period of the handicrafts lasting from the tenth century until the beginning of modern times. Need I say that these manifold activities have stamped their imprint upon every bone, muscle, nerve, and brain cell of the human organism, and if we would maintain it in its present integrity must we not from necessity repeat in some form or other the sensory and motor activities to which the present development is due?

Did time permit, it would be possible to show by further illustrations that even reason, judgment and the so-called higher faculties are rooted in the mechanism. We have spoken of the influence of the bodily organs upon mental states, but mental states also influence the bodily organs. All mental states are followed by bodily changes. As the psychologists tell us, "all consciousness leads to action." The action of the body upon mind, and the reactions of mind upon body go to make up the sum of human experiences. These experiences postulate a succession of functions that have been capitalized in structure as faculty. All that we are able to do today is the result of our previous physical education given us through heredity or through our experiences in former years. It is only when we consider how helpless we would be but for such physical training as we have received through our past efforts at work or play, or when we consider that there could have been no language, no art, no music, no agriculture, manufactories, or commerce—in fact no history without physical activity and muscle training—only then is it that we begin to realize the dignity and importance of the subject.

Some of you may ask: If physical training is considered so important a part of mental education, why has it not been brought into prominence before? To the prejudice against the body rooted in the asceticism of the early promoters of education I have already referred, as well as to the relegation of labor to the serfs and lower classes of society. Another reason may be found in the very nature of the school itself. The Greek word σχολή meant a place of leisure, a place to which pupils and teachers repaired when there was nothing else to do. Until a comparatively recent period the vast majority of schools in America were half-time schools. The so-called country school even now is conducted for only a few

weeks in the year. It is hardly to be expected that such schools, many of whose pupils are engaged in physical activity for nine months in the year, would devote much time to physical training. Montesquieu said: "We receive three different kinds of education, one from our parents, another from our teachers and another from the world." The education which we would naturally receive from our parents and home surroundings is now to a considerable extent wanting in consequence of the absence of home chores and industries, the large numbers living in city tenements and apartments, and other great changes that have taken place in the family life. The education that the world gives to most of us is, in consequence of the division of labor, narrowed to the smallest fraction of a trade or vocation, where the physical and mental efforts required, though often intense, are not varied enough to keep body and mind from deteriorating. Hence the cry of shattered nerves, heart failure, and broken constitutions.

The hopes for education in the future lie with the school boards and the teachers. How to work physical training into the overcrowded curriculum is the first problem. The first essential toward this end is, in my opinion, to convince teachers and school authorities of the absolute necessity of physical training as a fundamental basis for higher education. To hasten this conviction all teachers should be required to give evidence of their physical as well as mental efficiency before receiving their appointments. This requirement on the part of teachers should be supplemented by a further requirement on the part of the pupils, that all advancement from class to class and from school to school should be based upon a physical as well as a mental examination. Entrance to college also should be based upon a test of physical as well as mental efficiency. The moral effect of these physical requirements would be to throw the responsibility for physical condition back upon the parent, the preparatory schools, and teachers, as well as the pupil himself.

Objections to these requirements would undoubtedly be raised by those who still hold to the old theory of independence of body and mind or by those who recall individual instances of illustrious men who were weak, puny boys, and who would have been disqualified for entrance to college by a physical requirement. These exceptional cases are as nothing when compared with the great mass of individuals whose mental state is improved by the improvement of the body. No nation has ever attained intel-

lectual greatness that has not first laid the foundation in the physical training of their youth. If a requirement of physical fitness and efficiency is not introduced and maintained in our preparatory schools and colleges we shall have a continuance of the conditions that prevail today where one class of pupils carries bodily training in athletics to excess, a few exhaust their vitality through excessive mental application, while the largest class does not get enough bodily training to keep in good physical condition, or to permit the realization of half their mental and physical possibilities. This is the inevitable result where body and mind are thought to have separate interest and are made to antagonize each other. This course would seem to put a premium upon the student neglecting his body in hopes of advancing his mental and moral efficiency, as did the monks and philosophers of old. We now know that such a course in the long run is suicidal, and the institution that encourages it by failing to recognize the just claims of the body assumes a responsibility for which it should be held accountable. What we need to foster among our youth is not the spirit of competition as so many think, but the spirit of emulation that makes the highest mental and moral attainments the goal to be won, recognizing the necessity of physical efficiency to this end. I do not know of any better method of fulfilling the very broad obligations of our educational institutions than by making physical as well as mental training a part of the regular curriculum. There is no reason why physical work could not be as judiciously graded to meet the needs of the pupils in various stages of physical development as is any form of mental training. Under the head of physical training I should be glad to see included all forms of physical activity, including music, vocal and instrumental, drawing, painting, and modeling, and all forms of manual training, dancing, skating, swimming, rowing, bicycling—military drill—all forms of calisthenics, games, plays, and the various forms of athletic sports. No one of these exercises would furnish a complete system of physical training in itself, and from a developmental point of view, several might have to be given to counteract the effect of partial exercises, like manual training, military drill, etc. From an economic point of view plays, games, free exercises, and light gymnastics would be the most serviceable in the public schools, but a wider range of exercises should be arranged for preparatory schools and colleges. With such a variety of exercises we would expect to bring about not only a harmonious development of

the muscles, invigorate the heart, lungs, and other vital organs, as Huxley says, but so train the body as to make it the ready servant of the intellect and will, and enable it to do with ease and pleasure all the work that as a mechanism it is capable of. Some of the specific mental and physical qualities which would be developed by such a course would be increased powers of attention, will, concentration, accuracy, alertness, quickness of perception, perseverance, reason, judgment, forbearance, patience, obedience, self-control, loyalty to leaders, self-denial, submergence of self, grace, poise, suppleness, courage, strength, and endurance. All of these mental and moral qualities may be trained and developed through the physical activities. Moreover, if much of the so-called intellectual training obtained through books was correlated with these physical activities at the time in life when they dominate the interest of youth, much greater progress than is now realized would be made in the attainment of intellectual results. Here is a new field of research and scientific investigation. If, however, the teacher should be so unfortunate as to tell a boy that a baseball could not be curved by a pitcher, that the speed of a boat could not be hastened or retarded by the movements of a person within it, or that the human body is always lighter than the same volume of water, I am afraid that the boy's respect for science might be shattered for his daily experiences would have taught him to the contrary. I say daily experiences, but when we consider that there are boys today at Harvard who have never driven a nail, sawed or split a stick of wood, or built a fire, perhaps this assertion needs qualifying. The only field today where the mental and physical activities are correlated to any considerable extent, is in the field of athletic sports. I think I may say without fear of contradiction that these physical activities have furnished a greater opportunity for mental training through the expression of terse, vigorous English than any other subjects—primarily because the boy is interested in these matters and knows more nearly what he is talking about.

The weakness of this great athletic movement today from an educational point of view is the failure of young men to apply the teachings of the classroom to the problems that arise in connection with their sports, games, and physical exercises. Not only do they ignore the teachings of the chemical, physical, and physiological laboratories, but even the teachings of morality, ethics, and the principles of brotherly love. What has the teaching of the class-

room to do with the practice on the ball field? To use an illustration which I have used before: If a student attends a course of lectures on hygiene and repeats to the professor "parrot-like" what the professor has told him, about the care of his health, the importance of physical training, etc., he receives a mark to his credit toward a diploma. If on the other hand the student is moved by the lecturer to take a systematic course of physical training which is applied hygiene, he gets no credit for it in terms by which his other school and college efforts are judged. In one case he has sat in a stuffy lecture-room and improved his memory in hearing what he ought to do; in the other case he has formed correct habits of living—increased his physical and mental vigor, improved conduct and character and made himself a better man for anything a man may be called upon to do. Does anyone question for a moment which of these two men are best prepared for life—or which one is most likely to render service to his fellow-man? Does not the same principle apply to the teaching of ethics in the classroom and the practice of ethics on the ball field? Can we reasonably expect a student to be unmindful of the importance of applied hygiene, and not become equally obtuse to the importance of applied ethics? Is not this indifference to the practice of hygiene and ethics the legitimate outcome of our faulty methods of teaching—thinking without acting, words without deeds—precepts without examples? Can anything in education be more pernicious? I do not know of any better way of correcting this evil, and unifying the aims and purposes of education, than by giving a scholastic value to every effort toward self-improvement in physical training, just as always has been done for purely mental efforts. At the present time, in many schools and colleges, it is customary to forbid students to take honors in athletics, unless they have a creditable standing in their studies. In order to be consistent this requirement should be coupled with another, i. e., that no student should be given honors in his studies unless he attained a certain grade in his gymnastics or athletics. This last requirement would insure the conscientious student against sacrificing his health in view of raising his standing in scholarship, which at the present time he is likely to do on account of the keen competition to which he is subjected.

Judging from my experience at Yale some years ago, if physical training were made a part of the school curriculum, the class that stood the highest in scholarship would invariably stand the highest

in physical exercises. In order that such a requirement be fair to all classes, the grading should be based upon three factors, namely, the effort, the achievement, and the mental and physical results. In conclusion I will say that I believe such a scheme as I have described to be essentially practical, and when adopted will not only add to the physical vigor of our youth but also to their mental power and efficiency. Is not such a "consummation devoutly to be wished?"